Association of Pain and Depression in Those With Chronic Low Back Pain

The Mediation Effect of Patient Sexual Functioning

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Objectives: One theoretical model suggests that the pathway from pain to depression is through the disruption of social and relationship function. This study sought to test this hypothesis by considering the mediating effect of sexual functioning on the association between pain intensity and depressive symptoms in sexually active patients with chronic low back pain.

Materials and Methods: This was a cross-sectional study on consecutive patients attending a chronic pain management clinic in Iran. All measures (pain intensity, depressive symptoms, sex-specific sexual function) were obtained by a self-report questionnaire, completed by patients while attending the clinic. Sobel testing, including bias-corrected bootstrapping, was used to produce 95% confidence intervals (95% CI) to test the mediating effect of sexual function.

Results: A total of 742 patients (351 men, 391 women) took part in this study. Both the male and female mediation models showed a significant association between pain intensity and depressive symptoms, and both the models were significantly mediated by sexual functioning ($P < 0.001$). Effect size calculations show a medium to large effect on male patients (κ^2 0.23; 95% CI, 0.15-0.39) and a medium effect for female patients (κ^2 0.16; 95% CI, 0.06-0.28). Both the models accounted for over 50% of the variance in depressive symptoms (model R^2).

Discussion: This study has shown that sexual functioning significantly mediates the relationship between pain intensity and depressive symptoms in sexually active patients with chronic low back pain. Clinicians may wish to consider the assessment of sexual functioning within this patient group and align treatments that address sexual dysfunction and general pain management.

Key Words: back pain, sexual function, depression, mediation, sex

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Back pain is common and is considered a major health concern with lifetime prevalence estimated at over 70% in industrialized nations.[1] The recent burden of disease findings showed that back pain is the leading cause of disability-adjusted life years in Western Europe and Australia, and is ranked sixth of the top 25 diseases for disability burden globally.[2] Disability associated with back pain can have widespread effects on both the economy, because of extensive health care costs and absence from work,[3,4] as well as on the individuals and their family.[5,6] Similar evidence on low back pain prevalence, disease burden, and associated risk factors have also been reported in populations in Iran.[7,8]

Pain has consistently been shown in prospective epidemiological studies to be a risk factor for the development of depression,[9,10] with people reporting disabling spinal pain having over double the risk for developing depression.[11] Evidence indicates that psychological factors such as depression can represent a significant barrier to recovery,[12] and psychological interventions are now part of biopsychosocial treatment strategies for chronic pain conditions such as back pain.[13,14] Therefore, a reduction in the development of depression would be an important outcome for those who experience back pain.

The factors and mechanisms linking physical disorders such as back pain with psychological disorders such as depression are multifaceted. A model developed by Cohen and Rodriguez[15] suggests biological, behavioral, cognitive, and social pathways by which physical disorders such as pain can lead to affective disturbances such as depression. One specific pathway they suggest is that in those who experience pain, interruption, and disruption of normal social relationships (eg, interaction with partners, family members) can lead to the development of depression. Certainly, there is robust evidence that pain severity and disability is associated with relationship difficulties and marital discord,[16,17] which in turn has been shown to be associated with depression and chronicity within the person in pain.[18] One of the key determinants of depression within couples (with or without pain) is their level of intimacy and sexual function.[19] Evidence from studies on chronic pain, and back pain populations, show a considerably higher prevalence of sexual dysfunction compared with the population norms.[20–23] Despite strong evidence of associations between pain and sexual dysfunction, and pain and depression, no study to date has considered whether sexual dysfunction influences the relationship between pain and depression. Information such as this would be beneficial within clinical settings where there is an increasing awareness of psychosocial influences on pain and disability,[10] and where the consideration of relationship issues (eg, partners or family members) within treatment paradigms are becoming more common.[24,25]

The aim of this study was to test whether the association between pain severity and depressive symptoms is mediated by the level of sexual dysfunction in those who report back pain (Fig. 1). Furthermore, given the evidence

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of incongruence between men and women in the reporting of sexual function, pain, disability, and depression,[26,27] we wished to test whether the mediation effect of sexual function differs between men and women.

MATERIALS AND METHODS

This was a cross-sectional study on patients with chronic low back pain (CLBP) and was carried out between September 2012 and July 2013. Full ethical approval was granted by the Medical Ethics Committee at Qazvin University of Medical Sciences.

Participants

The study sample was inclusive of consecutive patients with CLBP attending the Outpatient Chronic Pain Clinic, Department of Neurosurgery, Shahid Rajaee Hospital, Qazvin, in Iran. Patients were eligible to participate if they had a confirmed diagnosis of CLBP (ie, persistent LBP with or without referred leg pain for at least 3 mo), were 18 years old or above, within a relationship with a sexually active partner, and able to speak and read Persian. Patients were excluded if they had any concurrent medical illness (cardiopulmonary, central nervous system, diabetes, intellectual disorder, rheumatic diseases, severe renal or hepatic dysfunction, and severe osteoporosis), serious spinal pathology (eg, fracture, metastatic), received spinal surgery, suspected or confirmed pregnancy, and cognitive impairment with the mini-mental state examination score of 23 or lower.

Procedure

A convenience sample of consecutive patients with confirmed CLBP (ascertained from medical records) who were scheduled to attend the outpatient chronic pain clinic at Shahid Rajaee Hospital over an 11-month period (September 2012 to July 2013) were invited to take part. Patients were contacted by telephone and were screened for eligibility by one of the authors (M.N.) with the assistance of 2 nurses. Eligible patients were invited to take part in the study at the same time as their scheduled appointment at the clinic. Informed consent was obtained from patients at the time of their appointment, and the patient was asked to complete a questionnaire containing the measures outlined below.

Measures

Depression

Depressive symptoms were assessed using the depressive symptoms scale of the Hospital Anxiety and Depression Scale (HADS).[28] The HADS Depression Scale comprises 7 items. All items are rated on a Likert-type scale ranging from 0 to 3, with higher scores indicating higher depressive symptoms. Scores range from 0 to 21; scores of 0 to 7, 8 to 10, and 11 to 21 indicate noncase, possible case, and probable case, respectively.[28] The HADS has been translated into Iranian (Persian) and has been shown to be highly valid and reliable as a screening tool.[29] The Cronbach α testing showed a good level of internal consistency within this sample (0.87).

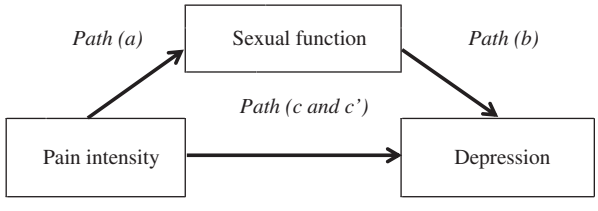

FIGURE 1. Mediation model of pain and depression by sexual functioning.

Pain Intensity

Pain intensity was measured using a visual analogue scale, which scored the level of pain in millimeters, with 0 mm for no pain and 100 mm for unbearable pain, and patients were asked to rate their pain level at the time of filling out their questionnaire.[30] Information on the duration of CLBP (months) was collected from the patients' medical records.

Sexual Functioning

Two sex-specific instruments were used to assess patients' sexual functioning. For the female patients, the Female Sexual Function Index (FSFI) was used.[31] The FSFI is a brief and multidimensional tool that comprises 19 items measuring 6 dimensions including the following: sexual desire (2 items), arousal (4 items), lubrication (4 items), orgasm (3 items), satisfaction (3 items), and pain (3 items). All items are scored on a Likert-type scale ranging from 1 to 5, with the higher score indicating higher level of sexual functioning. The full-scale score is obtained by adding the 6 domain scores. The Iranian version of the FSFI was found to be highly valid and reliable.[32] A good level of internal consistency was demonstrated using Cronbach α testing within this sample (0.79).

The International Index of Erectile Function (IIEF-15) was used to assess the male participants' sexual functioning.[33] The IIEF is a brief, multidimensional, self-administrated tool that has been shown to be cross-culturally and psychometrically valid.[33] The IIEF consists of 15 items that cover 5 dimensions: erectile function (6 items), orgasmic function (2 items), sexual desire (2 items), intercourse satisfaction (3 items), and overall satisfaction (2 items). Each item is rated on a 5-point or 6-point scale, with higher scores indicating better sexual functioning. The Iranian version of the IIEF demonstrates generally adequate psychometric validity and reliability.[34] Internal consistency within this sample was good (0.86) using the Cronbach α testing.

Demographic and Clinical Characteristics

Patients were asked to provide information regarding demographic characteristics; age, sex, accommodation (rural, city), educational status (unlettered, primary school, secondary school, college, or above), BMI score, and family income ($ < 300, 300 to 1000, > 1000 per month). Physical activity was measured by using 1 question "During the previous 12 months, how physically active have you been during leisure time? If your activity differs between e.g. summer and winter, please estimate the average activity." Patients were classified physically inactive (sedentary) if they indicated activities such as reading, watching TV, watching movies, or other sedentary activities during leisure time. Physically active patients were identified if they engaged in physical activities such as walking or cycling ≥ 2 hours a week, or performed more intensive activity (eg, going to the gym) for ≥ 30 minutes at each session at least on 1 occasion per week.

Statistical Analysis

Kolmogorov-Smirnov tests were conducted to assess distributions of all variables. Pearson correlations were used to assess the relationships of the key study variables (pain intensity, sexual functioning, and depressive symptoms). To assess the mediation role of sexual functioning, a series of statistical analyses were performed following suggested methodology.[35,36] As outlined within the aims of the study, the mediation hypothesis proposes that the pathway between pain intensity and depressive symptoms will be mediated by the patients' level of sexual functioning. A number of analysis stages were used to test this hypothesis (see Fig. 1 for an illustration): (1) the impact of the predictor (ie, pain intensity) on the proposed mediator (sexual functioning; path a), (2) the impact of the proposed mediator (ie, sexual functioning) on the outcome (ie, depression) while controlling for the predictor (ie, pain intensity; path b in Fig. 1), (3) the impact of the total effect of the predictor (ie, pain intensity) on outcome (ie, depression; path c), and (4) the impact of the direct effect of the predictor (ie, pain intensity) on outcome (ie, depression) after controlling for the proposed mediator (ie, sexual functioning; path c′). Both male and female mediation models were adjusted for potential confounds (age, educational status, BMI, duration of the CLBP, family income, and physical activity). Sobel mediation tests were used to investigate whether the indirect effect of the predictor on the outcome, through the proposed mediator, was significant.[37] In addition, due to evidence that the Sobel test is influenced by sample size and can be susceptible to type 1 error,[38] bootstrapping was used to produce 95% bias-corrected confidence intervals. Bootstrapping is a nonparametric resampling technique used to estimate indirect effect without requirement of distributional assumptions.[38] Furthermore, the 95% bias-corrected and accelerated confidence intervals are considered the most stringent test for computing indirect effects. The indirect effect is significantly different from 0 at $P < 0.05$ (2-tailed), if 0 is not within the 95% confidence intervals. Both the Sobel test and confidence intervals were computed using Preacher and Hayes'[38] bootstrapping procedure. In the current study, nonparametric bootstrapping procedure with 5000 resamples was used and tested the indirect path with a 95% confidence interval.

Estimations of the effect size of the indirect-mediated effect were calculated using the κ^2 statistic. The κ^2 is the ratio of the obtained indirect effect to the maximum possible indirect effect, a methodology advocated by Preacher and Kelley.[39] The κ^2 has advantages over other estimation techniques, as it is standardized and insensitive to sample size. The κ^2 values of 0.01, 0.09, and 0.25 represent small, medium, and large effect sizes, respectively.[39] To give clinical relevance to these effect sizes, the proportion-mediated effect (ie, % mediated) was calculated using the Fairchild et al product[40] (path a × path b/path c). All variables were standardized before performing any statistical analysis. Data analysis was performed using IBM SPSS version 20.0.

RESULTS

In all, 812 patients were eligible to take part in the study and 742 patients (91%) agreed: 351 men and 391 women. No significant differences were found in age, sex, family income, or education status between CLBP patients, who were eligible but did not take part, and those who did participate. Of the 742 participants, 53% were female and the sample indicated an average of 51 months of duration for their CLBP. Over one-third of the sample described themselves as physically active. Over two-thirds of men and over half of the women indicated receiving education at a secondary level or above, and the majority of the participants indicated a family income in the middle region of $300 to $1000 per month. Full characteristics of the sample can be seen in Table 1.

Table 2 includes Pearson correlations on the key variables (pain intensity, depressive symptoms, and sexual function) to illustrate the bivariate relationships. All measures (pain intensity, depressive symptoms, sexual functioning) were normally distributed.

Mediation of Sexual Functioning in Males

All paths within the model (Fig. 2) were significant; a positive relationship was found between pain intensity and depressive symptoms, indicating that increases in pain intensity are associated with increases in depressive symptoms (path c). Sexual functioning had a negative association with both pain intensity and depressive symptoms, indicating a decrease in the level of sexual functioning as both pain (path a) and depressive symptoms (path b) increase. Sobel test of the mediation effect (path c′) was significant ($z = 4.72$, $P = 0.0001$). This test indicates that sexual functioning in male patients significantly mediates the association between pain and depressive symptoms. Estimation of the effect size (κ^2) for the indirect effect indicates a medium to large effect size. Overall, the amount of variance explained by the model for depressive symptoms using the model R^2 was 0.504, indicating that just over 50% of the variance in depressive

TABLE 1. Sample Characteristics and Prevalence Figures

	Mean (SD)	
	Male (n = 351)	**Female (n = 391)**
Age	48.51 (13.46)	43.04 (11.17)
Back pain intensity (VAS, 0-100 mm)	76.57 (28.53)	73.91 (22.59)
Duration of CLBP (mo)	52.90 (25.98)	49.09 (20.01)
BMI (kg/m^2)	25.68 (8.30)	26.31 (10.86)
FSFI total score (female only)	N/A	18.20 (4.62)
Total score IIEF (male only)	6.47 (2.61)	N/A
Depression	9.98 (4.76)	9.89 (2.37)
	N (%)	
Demographics		
Accommodation status		
City	262 (74.6)	286 (73.1)
Rural	89 (25.4)	105 (26.9)
Education		
Unlettered	11 (3.1)	48 (12.3)
Primary school	88 (25.1)	140 (35.8)
Secondary school	128 (36.5)	127 (32.5)
College school or above	124 (35.3)	76 (19.4)
Physical activity		
Sedentary	239 (68.1)	247 (63.2)
Physically active	112 (31.9)	144 (36.8)
Family income monthly ($)		
≤300	60 (17.1)	85 (21.7)
300-1000	214 (61.0)	270 (69.1)
≥1000	77 (21.9)	36 (9.2)

BMI indicates body mass index; CLBP, chronic low back pain; FSFI, Female Sexual Function Index; IIEF, International Index of Erectile Function; N/A, not applicable; VAS, visual analogue scale.

TABLE 2. Correlations of Depression, Pain Intensity, and Sexual Functioning

Scales	Depression	Sexual Functioning	Back Pain Intensity
Depression	—	−0.49*	0.52*
Sexual functioning	−0.35*	—	−0.39*
Back pain intensity	0.36*	−0.41*	—

Intercorrelations for female patients are presented above the diagonal, and male patients are presented below the diagonal.
*$P < 0.01$.

symptoms can be explained by this model. Calculation of the proportion-mediated effect showed that 59% of the pathway between pain intensity and depressive symptoms is explained by sexual function.

Mediation of Sexual Functioning in Female Patients

As with the male model, all paths within the female model were significant (Fig. 3). Results show a positive association between pain intensity and depressive symptoms (path c) and that sexual functioning has a negative association with both pain intensity and depressive symptoms (paths a and b). Sobel test of mediation was significant ($z = 3.13$, $P = 0.001$), indicating that sexual functioning in female patients significantly mediates the pathway between pain intensity and depressive symptoms. Test of effect size (κ^2) for the mediation indicates a small to medium effect of sexual functioning as a mediator in the pathway between pain intensity and depressive symptoms. Overall, model R^2 was 0.534, indicating that 53% of the variance in depressive symptoms for female CLBP patients can be explained by this mediation model. Calculation of the proportion-mediated effect showed that 31% of the pathway between pain intensity and depressive symptoms in female patients was explained by sexual function.

DISCUSSION

This study tested the mediation effect of CLBP patients' sexual functioning on the pathway between pain intensity and depressive symptoms. The findings of the mediation models give some support to the hypothesis that the interruption of normal social relationships (in this case, reduced sexual function in sexually active patients) brought about by pain intensity is associated with greater levels of depressive symptoms. Analysis showed a significant mediation effect of sexual functioning on the pathway between pain intensity and depressive symptoms, this effect appeared greater for male patients compared with female patients.

Comparison With Existing Literature

At a national level, a recent paper on the prevalence and associated factors of back pain from an Iranian National Health study shows similar demographic characteristics to this cohort,[8] and a recent review of 26 studies on back pain within Iran shows a consistent association of pain and depression in such populations.[7] Broadening the scope internationally, this study's cohort reports slightly higher levels of pain intensity than a European wide study on those with chronic pain within the community[41]; however, it is consistent with the reporting of pain intensity, pain duration, and depressive symptoms (eg, mild to moderate range), in comparison with a large sample ($n > 5500$ patients) of patients with chronic pain who attend pain management programs in Australia,[42] and in comparison with those attending a pain management program within a UK sample.[21]

In terms of sexual functioning, both measure have demonstrated validity and reliability in Iranian populations.[32,34] Comparisons of this cohorts' scores for female sexual functioning, with women who have a diagnosed sexual dysfunction disorder and population control (original inception and validation paper of the FSFI, Rosen et al[31]), show that this CLBP female population have sexual functioning scores more akin, but not as severe, to those who have a sexual dysfunction disorder compared with population norms. A comparable pattern is found in this current study's male CLBP cohort, with similarities to an erectile dysfunction group in terms of erectile function and orgasmic function, and lower sexual desire, but less effect on the levels of satisfaction with intercourse and overall satisfaction (comparison with original inception and validation cohort for the IIEF-15 measure, Rosen et al).[33] These high rates of sexual dysfunction are reflected within similar chronic pain cohorts.[21,23] Considering generalizibility, a recent global survey of sexual problems ($n = 27{,}500$) showed little differences in the prevalence rates of sexual problems between Westernized countries in comparison with countries within the Middle East.[43] In addition a recent study on sexual function epidemiology within the female Iranian population (Safarinejad[44]) reports similar prevalence rates as compared with other countries globally. Although rates of sexual dysfunction seem generalizable, one must not overlook the cultural and ethnic differences in the attitudes toward sex. Studies have

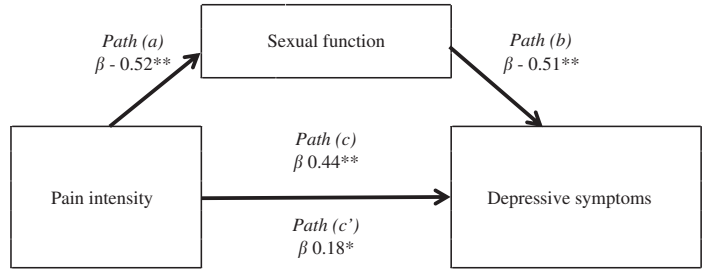

FIGURE 2. Mediation model of pain and depression by sexual functioning for men (n = 351). Mediation analysis adjusted for age, accommodation status, education level, duration of back pain, BMI, and physical activity. Sobel test: $z = 4.72$, $P < 0.001$, effect size κ^2: 0.23 (95% CI, 0.15-0.39), **$P < 0.001$, *$P < 0.05$, β: standardized β coefficients.

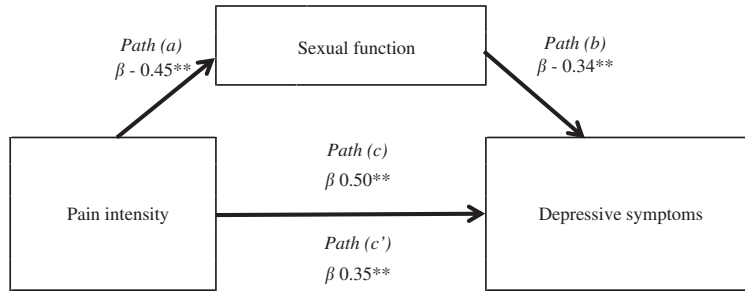

FIGURE 3. Mediation model of pain and depression by sexual functioning for women (n = 391). Mediation analysis adjusted for age, accommodation status, education level, duration of back pain, BMI, and physical activity. Sobel test: $z = 3.13$, $P = 0.001$, effect size κ^2: 0.16 (95% CI, 0.06-0.28), $^{**}P < 0.001$, $^{*}P < 0.05$, β: standardized β coefficients.

shown differences based on culture, religion, and ethnicity[45]; however, such effects are modest and it seems that greater variability exists within groups than between groups.

In summary, this current CLBP cohort reports a high level of pain intensity and depression similar to other populations attending active pain management, and also reports higher levels of sexual dysfunction compared with population norms, although not as severe as those formally diagnosed with sexual dysfunction disorders.

Strengths and Weaknesses

A key strength of this study is the theoretically driven hypothesis and the clarity of the mediation model that we feel has clinical relevance. This study included comprehensive assessments of sexual dysfunction both for men and women using validated instruments. The study also included a reasonable sample size with a very low percentage of nonresponse that would be unlikely to affect the association strengths or direction of the variables within our results. The key limitation is the cross-sectional design; it is impossible to assert any causal conclusions within in this analysis, and it is not known whether depressive symptoms or sexual dysfunction predate pain symptoms. Nevertheless, our results are of interest, the associations between variables are statistically strong, and if we were to produce alternative analysis combinations (eg, pain intensity as outcome, depression as predictor, mediator) there would still be a robust role for sexual dysfunction within this triad. Indeed, the hypothesized model proposed by Cohen and Rodriguez,[15] outlines a reverse pathway whereby affective disorders can disrupt social interaction that could lead to changes in behavior for the person that may contribute to physical disorders such as pain. However, as stated within the introduction, this current study's focus was on the consequences of pain (ie, depressive symptoms) rather than on the causal factors for pain. Although the choice of our analysis model was theoretically informed, there is a clear need for a longitudinal perspective if we are to fully understand the potential developmental aspects of the relationships between pain, sexual dysfunction, and depressive symptoms, and to account for the likely interrelationships of these variables.

A further limitation is this study's lack of information on current medication use of the participants. Evidence has shown clear detrimental effects of opiate and antidepressant medication on sexual function (eg, low libido for men and women, erectile dysfunction in men), but little or no effect for anti-inflammatory medication.[46,47] Added to this general pharmacological effect is the influence and interaction within pain populations that shows greater complexity; for example, a recent meta-analysis showed better sexual functioning for pain patients prescribed opiates due to the reduction in pain.[48] Medication use and influence on sexual function is an issue that further research should investigate. We are also limited by our current sample: CLBP patients attending outpatient clinics for their back pain who report high levels of pain intensity and depressive symptoms. Clearly, further research is needed on those with CLBP who report less intensive pain, as this is more broadly reflective of the wider CLBP population. In addition, such further research would inform whether sexual dysfunction has less of an effect at much lower levels of pain, as our linear model would suggest.

There are a number of challenges to the measurement of physical activity with no accepted gold standard.[49] In this study, we chose to devise a measure to capture the general level of physical activity over a 12-month period using a single question. However, best practice suggests a more specific timescale (eg, minutes or hours within a day, per week) and also that different types of activity are measured (eg, sleep/rest, sedentary leisure time, sedentary work time, light aerobics from work or leisure, heavier aerobics from work or leisure time, strenuous exercise).[49] Future studies should consider a more specific measure of physical activity, given the likely interrelationship between pain and physical activity restriction and the evidence of the importance of physical activity to sexual function.[26] A final limitation concerns a general criticism within the field of sexual and relationship research. Although measurement of an individual's sexual function is valid, it should not be overlooked that sexual activity between consenting adults is reciprocal, and therefore the patient's partners' reaction, mood, and ability to function sexually is also important.[50] Ideally, studies would include information from both partners about their sexual function/sexual satisfaction/relationship length/relationship quality to assess potential dyadic influence and congruence.

Clinical Relevance

Our findings show the strong relationships between pain intensity and depressive symptoms, pain intensity and sexual functioning, and sexual functioning and depressive symptoms for sexually active CLBP patients. This confirms previous research on these independent effects for those with back pain and chronic pain.[21–23] By combining these variables within a mediation model, findings show that sexual function significantly mediates the pathway between

pain intensity and depressive symptoms. We believe that these findings are clinically relevant. As outlined within the results, the proportion-mediated effect of sexual function in the relationship between pain intensity and depressive symptoms was considerable for both men (59%) and women (31%). One explanation for the differences between men and women may be because of the use of differing sexual function measures within this study (justified here owing to physiological differences between sexes), and that the measure for men is more conceptually related to both pain and depression. However, research has shown that the determinants of sexual satisfaction differ between the sexes; men emphasize physical health as a much more important factor, whereas women do not.[26] It may be that the additional impact of pain on physical function leads to a greater impact on sexual function for men, leading to an increase in depressive symptoms.

The current findings suggest that it may well be worthwhile for clinicians to enquire about the sexual activity of their patients, and if sexually active, to enquire about the impact that pain may be having on such an activity. This seems especially pertinent to men with CLBP. However, one must not overlook other important factors related to both the experience of pain and sexual function. For example, the findings on sexual function could be a partial reflection of the level of fear avoidance within the participant.[51] It may be that the patient believes that sexual activity could lead to serious painful injury and therefore avoids all such activity. Further work is needed to understand the mechanisms resulting in a reduction in sexual function for those who report pain. Clinicians may benefit from enquiring as to the beliefs that may influence the reduction in sexual function for patients with pain. Furthermore, sexual function does not occur in isolation and forms part of the overall relationship between partners. Substantial evidence shows the effects of pain on the relationship quality between couples, specifically operant and communicative influences, whereby the reduction in sexual function may be part of the larger dynamic between couples (eg, solicitous responses, punishing responses, empathy, and intimacy).[52] Clinicians should consider the broader "relationship" context of patients who have sexual function problems and how these issues may affect sexual functioning.

Clearly, pain management and a reduction in pain are the primary goal of treatment, and this would most likely reduce or limit the impact of sexual problems and resultant depressive symptoms. However, where pain reduction is not possible, patients, who report significant problems with sexual function, could be provided with helpful information and advice on reducing the impact of pain on sexual activity (eg, body positioning, exercise, help to reduce fatigue). One theoretical model that might be helpful within this context is the "Good-Enough Sex" model.[53] This model can help patients adapt and accommodate to the adjustments (physical, mental) that may be needed when they have sexual activity restriction related to their back pain. Referrals to sexual therapists or counselors could take place for patients and their partners who have persistent issues of sexual dysfunction. Increasing attention has been given to the importance of psychosocial issues in the treatment of chronic pain.[12,14] A key area of treatment for those with CLBP is the reduction in psychological distress; perhaps a reduction in the impact of pain on the sexual function could convey additional benefits to patients.

CONCLUSIONS

This study has shown that sexual functioning significantly mediates the relationship between pain intensity and depressive symptoms in those with CLPB. Clinicians may wish to consider the assessment of sexual functioning within this patient group and align treatments that address sexual dysfunction and pain management.

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APPENDIX

TABLE 1. Results From Mediation Analyses With Depression as Outcome Measure

											Sobel Test		Bootstrapping (95% CIs)*		95% CIs for κ^2				95% CIs for R^2 Med	
Hypothesized Mediators	**a (SE)**	***P***	**b (SE)**	***P***	**c (SE)**	***P***	**c′ (SE)**	***P***	**ab (SE)**	***P***	***z***	***P***	**Lower**	**Upper**	**κ^2**	**Lower**	**Upper**	**R^2 Med**	**Lower**	**Upper**
Female sexual functioning (FSFI)	−0.446 (0.078)	0.0001	−0.342 (0.089)	0.0002	0.504 (0.080)	0.0001	0.351 (0.086)	0.0001	0.153 (0.061)	0.002	3.132	0.001	0.056	0.303	0.155	0.059	0.278	0.154	0.055	0.297
Erectile functioning (IIEF)	−0.516 (0.072)	0.0001	−0.505 (0.079)	0.0001	0.436 (0.079)	0.0001	0.175 (0.082)	0.03	0.260 (0.078)	0.0001	4.717	0.0001	0.157	0.390	0.234	0.150	0.332	0.145	0.067	0.236

*Bias-corrected and accelerated CIs.
CI indicates confidence interval, R^2 MED, proportion mediation effect.